

AMENDMENTS TO THE CLAIMS

The following claim listing represents the claims as pending in the current application.

1-10. **(Cancelled)**

11. **(Currently Amended)** An electrolysis cell system for a cell with a boundary, a liquid metal and an electrolyte, having specific operational and geometric parameters, ~~[[and]]~~ the electrolysis cell system comprising:

~~means for imposing one or more coils that impose~~ on said cell an external, ~~time-varying and/or~~ alternating magnetic field which varies dependent on time;

~~means for determining amplitude and frequency values of the magnetic field through that are used by the one or more coils in imposing the magnetic field on said cell, the amplitude and frequency values being determined through~~ wave reflection analysis on a theoretical wall whose parameters are sufficiently representative of said cell wall's parameters; ~~[[and]]~~

~~means for applying said wherein the~~ magnetic field is applied substantially essentially at the cell boundary; ~~whereby said and wherein the~~ magnetic field ~~tends to~~ parametrically and dynamically ~~de-synchronize~~ de-synchronizes resonance instability near said cell's walls.

12. **(Currently Amended)** A system according to claim 11, ~~comprising means for deriving a magnetic field through the analysis of reflection on wherein the theoretical wall used by the means for determining amplitude and frequency values of the magnetic field in the wave reflection analysis comprises~~ a theoretical infinite wall.

13. **(Currently Amended)** A system according to claim 11, ~~comprising means for carrying out analysis on wherein the wave reflection analysis performed by the means for determining amplitude and frequency values of the magnetic field is applied to a rectangular cell wall and means for adapting the analysis to suit other geometries.~~

14. **(Currently Amended)** A system according to claim 11, ~~comprising means for applying said analysis wherein the wave reflection analysis performed by the means for determining amplitude and frequency values of the magnetic field is applied substantially essentially only to one section of the cell.~~

15. **(Currently Amended)** A system according to claim 11, ~~comprising a single ring encircling the cell which applies a field which wherein the one or more coils surround the cell such that the imposed magnetic field is essentially substantially vertical.~~

16. **(Currently Amended)** A system according to claim 11, ~~comprising means for applying a wherein the magnetic field is of the form~~

$$b = 1 + b_0(x, y) \cos(\omega_0 + \theta_0).$$

where

b_0 is the normalized amplitude,

ω_0 is the frequency, and

θ_0 is the initial phase of the ~~controlling external~~ magnetic field which is to be obtained.

17. **(New)** A system according to claim 11, wherein the means for determining amplitude and frequency values of the magnetic field solves the following equations to derive the imposed magnetic field:

$$\frac{\delta^2 \eta}{\delta t^2} - c^2 \nabla^2 \eta = c^2 \nabla \phi \cdot [\nabla \times b(x, y, t) e_x] - v_1 \frac{\delta \eta}{\delta t},$$

$$\nabla^2 \phi = -\beta \eta, \text{ and}$$

$$\frac{\delta \phi}{\delta n} = 0, \quad \frac{\delta \eta}{\delta n} = -b(x, y, t) \frac{\delta \phi}{\delta \tau} \text{ at } \Gamma.$$

18. **(New)** A system according to claim 11, wherein the means for determining amplitude and frequency values of the magnetic field comprises a mathematical model.

19. **(New)** A system according to claim 13, wherein the wave reflection analysis performed by the means for determining amplitude and frequency values of the magnetic field is adapted to suit other geometries.